IBEW
EXHIBIT 2.1
ICC DOCKET 06-0179

Brief History of "ALBAT"

The American Line Builders Joint Apprenticeship & Training Committee (ALBAT) was officially established on August 26, 1958, the result of a cooperative undertaking by the American Line Builders Chapter, NECA and the International Brotherhood of Electrical Workers, Fourth and Sixth Districts. This cooperative effort was in response to the need for a recognized, pragmatic program for training persons in the skills of performing outside electrical construction work.

In addition to the apprenticeship program for the occupation of Journeyman Lineman, ALBAT has also established programs for the occupations of Journeyman Sub-Station repairman and Traffic Signal Repairer/Street Light Serviceperson.

Qualified Employees make the Difference

All individuals who are indentured into the ALBAT Program are trained to make sure that they are qualified to meet any challenge in the outside electrical construction industry.

Introductory Training School

Each apprentice is required to attend a three week "Introductory Training" class session at the ALBAT Training Center in Medway, Ohio. The training consists of instruction in the following subjects: Climbing, First Aid and General Safety, Basic Electrical Theory, Knot Tying and Rigging, and IBEW and NECA Structures. Upon satisfactory completion of the "Introductory Training" school, the apprentice will be ready for assignment in their home local area to begin the OJT portion of their apprenticeship.

Classroom Instruction

Each apprentice shall be required to complete three years of related instructions away from the job for a minimum of 144 hours per year. The time spent in related instruction shall be in addition to the required 7,000 hours of "on-the-job" training and shall not be considered hours of work. Periodic examinations shall be administered and properly supervised with the results reported the committee so that the apprentice's progress may be evaluated and monitored.

On–The–Job Training

In order to acquire the necessary skills of the trade in its various categories, the apprentice shall be provided with on-the-job training to round out his or her skills. View a complete breakdown of on-the-job training program.

Requirements for Graduation from the ALBAT Program

Apprentices must meet all requirements of the Apprenticeship Standards prior to graduating and becoming a Journeyman in their chosen field. The requirements include: 7000 hours of apprenticeship training, a minimum of 504 classroom and related instruction hours, successfully completing the prescribed set of course material consisting of 18 workbooks and 21 tests, obtaining and maintaining a Class "A" Commercial Driver's License, and a Department of Transportation Medical Card, obtaining and maintaining current First Aid and CPR Training Certification Cards.

Further Information

Further information regarding of the apprenticeship programs or skill enhancement classes may be obtained by contacting Howard Miller at the ALBAT office at P. O. Box 370, Medway, OH 45341, 937/849-4177 or 800/223-9339.

ALBAT WEBSITE

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Breakdown of On-The-Job Training

First Period

Perform duties as prescribed by the written policy statement of the Committee, providing for work both on the ground and aloft including climbing to assure suitability for the trade before probationary period expires.

Approximate Hours: 1,000

Transmission

Steel

Assembly and erection of steel towers, placement of footings, and attachment of insulators and materials, and the stringing, splicing, dead-ending, armor rodding, and clipping of conductors.

Approximate Hours: 750

Wood

Framing, erection, and guying of wood poles and the installation of hardware insulators and conductors thereon.

Approximate Hours: 750

Substations

Assembly and erection of steel and wood and the installation and connection of busses, grounds, switches, circuit breakers, transformers, regulators, and other substation equipment.

Approximate Hours: 500

Distribution

New Construction

Material handling, framing, and erection of poles, installation of anchors and guys, stringing, splicing, sagging of conductors on de-energized construction work.

Approximate Hours: 1000

Maintenance and Rebuild

General Maintenance work near energized distribution conductors including pole replacement, conductor replacement, changing insulators and crossarms, changing and installing transformers, capacitors, regulators, switches, and other distribution apparatus.

Approximate Hours: 1000

Street Lighting

Installation and maintenance of series and multiple street lighting systems and the associated control systems

Approximate Hours: 1000

Live Line Maintenance

Rubber glove work on energized primary circuits. Hot stick work on distribution and subtransmission voltages.

Approximate Hours: 1,000

TOTAL: 7000 hours

All such work shall be performed under the supervision of a journeyman. Supervision should be of such nature as to encourage the development of responsibility and initiative.

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ALBAT PROGRAM
REFERENCE BOOKS

OLD First Year Reference Books

1. Electrical Field Reference Handbook – Thompson
2. Cables and Wiring 2nd Edition – Cadick
3. DC Theory Textbook – NJATC
4. Traffic Control Flagger Certification Handbook
5. Keller's Official OSHA Construction Safety Handbook
6. Lineman's and Cableman's Handbook – Shoemaker-Mack
7. Building a Foundation in Mathematics – Thompson
8. NJATC Training Partner Reference Guide

NEW First Year Reference Books

1. DC Theory Textbook – NJATC
2. The Lineworker's Rigging Handbook – Alexander Publication
3. Keller's Utility Safety Handbook
4. Building a Foundation in Mathematics – Thompson
5. Underground Distribution – Alexander Publication
6. The Guidebook for Linemen & Cablemen – Wayne Van Soelen

Second Year Reference Books

1. Distribution Volume I (Transformer Theory for Line People)
2. Hot Sticks – A.B. Chance
3. Terminations & Splices: Theory to Practice – NJATC
4. Test Instruments for Today's Electricians Textbook – NJATC
5. AC Theory Text

Third Year Reference Book

1. Distribution Volume II

Lesson Outline

National Electrical Course for Apprentice Linemen

OLD — First Year

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Lesson Number	Code	Title	Reference(s)
UNIT 1-1			
1-1-1	O-1	How to Study This Course	Inf. Sheet
1-1-2	O-2	Understanding Your Apprenticeship and Responsibilities	App. Agreement, Inf. Sheet
1-1-3	O-3	The Attributes of an IBEW/NECA Apprenticeship	Inf. Sheet
1-1-4	O-4	The IBEW and Its History	Hist. & Structure of the IBEW
1-1-5	O-5	NECA's Structure and Heritage	This is NECA, Inf. Sheet
1-1-6	O-6	Your Job and The Future It Holds	Inf. Sheet
1-1-7	S-1	Attitudes	Inf. Sheet
1-1-8	J-1	Tool Identification	Klein, Inf. Sheet
1-1-9	J-2	Use and Care of Hand Tools	Klein, Inf. Sheet
1-1-10	S-2	Introduction to OSHA	Inf. Sheet
1-1-11	S-3	Electrical Hazard Awareness	Keller, Inf. Sheet -
1-1-12	S-4	Energized and Non-Energized Parts	Inf. Sheet
1-1-13	J-3	Flagging, Signs, and Barricades	Hurst, Inf. Sheet
1-1-14	J-4	Climbing Equipment, Inspection and Care	Kurtz, Inf. Sheet
1-1-15	S-5	Fall Protection	Keller, Inf. Sheet
1-1-16	S-6	Climber Cutouts	Kurtz
1-1-17	J-5	Climbing Poles	Kurtz, Inf. Sheet
1-1-18		Unit One Review	All Previous Lessons
UNIT 1-2			
1-2-1	O-7	Marketing I	Inf. Sheet
1-2-2	O-8	Communications	Inf. Sheet
1-2-3	S-7	Shock, Arc, and Blast	Inf. Sheet
1-2-4	J-6	Rubber Gloves and Sleeves, Care and Use	Kurtz, Inf. Sheet
1-2-5	J-7	Protective Line Devices, Care and Use	Kurtz, Inf. Sheet
1-2-6	S-8	Pole Top Rescue	Kurtz, Inf. Sheet
1-2-7	S-9	Bucket Rescue	Kurtz, Inf. Sheet
1-2-8	S-10	Working in Confined Spaces/Vault Rescue	Keller, Inf. Sheet
1-2-9	S-11	Safety Meetings	Keller, Inf. Sheet
1-2-10	S-12	First Aid, Safety, and Health	Keller, Inf. Sheet
1-2-11	J-8	Hand Signals	Kurtz, Garby, Inf. Sheet
1-2-12	J-9	Powered Equipment	Kurtz, Inf. Sheet
1-2-13	J-10	Wood Poles - Inspection and Maintenance	Kurtz, Inf. Sheet
1-2-14	J-11	Loading, Hauling, and Unloading Poles	Kurtz
1-2-15	J-12	Digging Holes, Trenches, and Setting Poles	Kurtz, Keller
1-2-16	J-13	Framing Wood Poles	Kurtz
1-2-17	J-14	Tail-Board Discussions	Inf. Sheet
1-2-18		Unit Two Review	All Previous Lessons
UNIT 1-3			
1-3-1	M-1	Addition and Subtraction of Whole Numbers	NJATC Math, Inf. Sheet
1-3-2	M-2	Multiplication and Division of Whole Numbers	NJATC Math, Inf. Sheet
1-3-3	M-3	Fractions	NJATC Math, Inf. Sheet
1-3-4	M-4	Decimals	NJATC Math, Inf. Sheet
1-3-5	M-5	Percentage	NJATC Math, Inf. Sheet
1-3-6	T-1	The Structure of Matter	DC Theory
1-3-7	T-2	Electron Theory	DC Theory, Inf. Sheet
1-3-8	T-3	Electrical Units I	DC Theory
1-3-9	T-4	Electrical Units II	DC Theory, NJATC Math
1-3-10	T-5	Sources and Effects of Electricity	DC Theory, Inf. Sheet
1-3-11	J-15	Ropes, Knots, Hitches, and Splices	Garby, Kurtz
1-3-12	J-16	Wire Rope	Garby
1-3-13	J-17	Slings	Garby, Kurtz, and Inf. Sheet
1-3-14	J-18	Rigging Hardware	Garby
1-3-15	J-19	Blocks	Garby
1-3-16	S-13	Personal Protective Equipment	Keller, Inf. Sheet
1-3-17		Unit Three Review	All Previous Lessons Lesson

OLD-first year (cont.)

Number	Code	Title	Reference(s)
UNIT 1-4			
1-4-1	M-6	Solving Equations	NJATC Math
1-4-2	T-6	Ohm's Law	DC Theory, NJATC Math
1-4-3	T-7	Power	DC Theory, NJATC Math
1-4-4	J-20	Ladders/Step Bolts	Kurtz, Keller, Inf. Sheet
1-4-5	J-21	Two-Way Radios	Inf. Sheet
1-4-6	J-22	Guy Types	Kurtz
1-4-7	J-23	Guy Installations	Kurtz
1-4-8	J-24	Guy Strength and Sizes	Kurtz
1-4-9	J-25	Anchors	Kurtz
1-4-10	J-26	Line Conductors	Kurtz
1-4-11	J-27	Cross Arms and Attachments	Kurtz
1-4-12	J-28	Insulators	DC Theory, Inf. Sheet
1-4-13	T-8	Resistance in Series Circuits	DC Theory, Inf. Sheet
1-4-14	T-9	Current in Series Circuits	DC Theory, Inf. Sheet
1-4-15	T-10	Voltage in Series Circuits	DC Theory, Inf. Sheet
1-4-16	T-11	Power in Series Circuits	All Previous Lessons
1-4-17		Unit Four Review	
UNIT 1-5			
1-5-1	M-7	Mathematics For Parallel Circuits	DC Theory, NJATC Math
1-5-2	T-12	Voltage in Parallel Circuits	DC Theory
1-5-3	T-13	Resistance in Parallel Circuits	DC Theory
1-5-4	T-14	Current in Parallel Circuits	DC Theory
1-5-5	T-15	Power in Parallel Circuits	DC Theory
1-5-6	T-16	Principles of Magnetism	DC Theory, Inf. Sheet
1-5-7	T-17	Magnetic Induction	NJATC Math
1-5-8	M-8	Ratios and Proportions	Kurtz
1-5-9	J-29	The Electric System	Cables and Wiring, Kurtz
1-5-10	J-30	Wire Sizes, Types, and Characteristics	Kurtz, Inf. Sheet
1-5-11	J-31	Stringing Wire	Kurtz
1-5-12	J-32	Tying-In Conductors	Kurtz
1-5-13	J-33	Overhead Service	Kurtz
1-5-14	J-34	Tree Trimming	Keller, Inf. Sheet
1-5-15	J-35	Good Housekeeping	All Previous Lessons
1-5-16		Unit Five Review	
UNIT 1-6			
1-6-1	T-18	Resistance in Combination Circuits	DC Theory
1-6-2	T-19	Current in Combination Circuits	DC Theory
1-6-3	T-20	Voltage in Combination Circuits	DC Theory
1-6-4	T-21	Power in Combination Circuits	DC Theory
1-6-5	J-36	Underground Systems	Kurtz, Inf. Sheet
1-6-6	S-14	Excavation and Shoring	Kurtz, Keller
1-6-7	J-37	Laying Conduit	Kurtz, Cable and Wiring
1-6-8	J-38	Manhole Construction	Kurtz
1-6-9	J-39	Cable Types	Kurtz, Cables and Wiring
1-6-10	J-40	Pulling Cable	Kurtz, Cables and Wiring
1-6-11	J-41	Planning and Design For Underground Systems	Kurtz
1-6-12	S-15	Baskets, Aerial Lifts, Aerial Platforms	Kurtz, Inf. Sheet
1-6-13	S-16	Grounding and Protective Grounds	Kurtz, Inf. Sheet
1-6-14	J-42	Taking a Line Out of Service	Kurtz
1-6-15	S-17	Lock-Out Tag-Out	Keller, Inf. Sheet
1-6-16		Unit Six Review	All Previous Lessons

Codes For Lessons in The First Year

O - Orientation
S - Safety
J - Job Information
M - Mathematics
T - Theory

Lesson Outline

National Electrical Course for Apprentice Linemen

NEW – First Year

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Revised 12/17/05

Lesson Number	Code	Title	Reference(s)
UNIT 1-1			
1-1-1	O-1	How to Study This Course	Inf. Sheet
1-1-2	O-2	Understanding Your Apprenticeship and Responsibilities	App. Agreement, Inf. Sheet
1-1-3	O-3	The Attributes of an IBEW/NECA Apprenticeship	Inf. Sheet
1-1-4	O-4	Your Job and The Future It Holds	Inf. Sheet
1-1-5	S-1	Safety Awareness -- On the Job	Keller, Inf. Sheet
1-1-6	J-1	Tool Identification	Klein (Appendix A), Inf. Sheet
1-1-7	J-2	Use and Care of Hand Tools	Klein (Appendix A), Inf. Sheet
1-1-8	S-2	Introduction to OSHA	Inf. Sheet
1-1-9	S-3	Electrical Hazard Awareness	Van Soelen, Keller, Inf. Sheet
1-1-10	S-4	Energized and Non-Energized Parts	Van Soelen, Inf. Sheet
1-1-11	J-3	Climbing Equipment, Inspection and Care	Van Soelen, Inf. Sheet
1-1-12	S-5	Fall Protection	Van Soelen, Keller, Inf. Sheet
1-1-13	S-6	Climber Cutouts	Van Soelen
1-1-14	J-4	Climbing Poles	Van Soelen, Inf. Sheet
1-1-15	S-7	Pole Top Rescue	Van Soelen, Inf. Sheet
1-1-16	S-8	Bucket Rescue	Van Soelen, Inf. Sheet
UNIT 1-2			
1-2-1	O-5	Sexual Harassment	Preventing Sexual Harassment
1-2-2	O-6	Marketing I	Inf. Sheet
1-2-3	O-7	The IBEW and Its History	Hist. & Structure of the IBEW
1-2-4	O-8	NECA's Structure and Heritage	This is NECA, Inf. Sheet
1-2-5	S-9	Shock, Arc, and Blast	Inf. Sheet
1-2-6	J-5	Rubber Gloves and Sleeves, Care and Use	Van Soelen, Inf. Sheet
1-2-7	J-6	Protective Line Devices, Care and Use	Van Soelen, Inf. Sheet
1-2-8	S-10	Working in Confined Spaces/Vault Rescue	Keller, Inf. Sheet
1-2-9	S-11	Safety Meetings, Tail-Board Discussions	Keller, Van Soelen, Inf. Sheet
1-2-10	S-12	First Aid, Safety, and Health	Keller, Inf. Sheet
1-2-11	J-7	Hand Signals	Van Soelen, Inf. Sheet
1-2-12	J-8	Powered Equipment Safety – Compressors & Generators	Van Soelen, Inf. Sheet
1-2-13	J-9	Wood Poles - Inspection and Maintenance	Van Soelen, Inf. Sheet
1-2-14	J-10	Setting Poles and Setting Poles Near or Around Circuits	Van Soelen
1-2-15	J-11	Digging Holes and Trenches	Van Soelen, Keller
1-2-16	O-9	Avoiding the Hazards of Drug Use	Information Sheet
UNIT 1-3			
1-3-1	M-1	Add, Subt, Multi, Div, of Whole Numbers	NJATC Math, Inf. Sheet
1-3-2	M-2	Fractions	NJATC Math, Inf. Sheet
1-3-3	M-3	Decimals	NJATC Math, Inf. Sheet
1-3-4	M-4	Percentage	NJATC Math, Inf. Sheet
1-3-5	T-1	The Structure of Matter	NJATC DC Theory
1-3-6	T-2	Electron Theory	NJATC DC Theory, Inf. Sheet
1-3-7	T-3	Electrical Units I	NJATC DC Theory
1-3-8	T-4	Electrical Units II	NJATC DC Theory, NJATC Math
1-3-9	T-5	Sources and Effects of Electricity	NJATC DC Theory, Inf. Sheet
1-3-10	J-12	Ropes, Knots, Hitches, and Splices	Alexander, Van Soelen
1-3-11	J-13	Wire Rope	Alexander
1-3-12	J-14	Ladders/Step Bolts	Van Soelen, Keller, Inf. Sheet
1-3-13	J-15	Powered Equipment Safety - Underground	Information Sheet
1-3-14	J-16	Powered Equipment Safety - Digger Derick	Information Sheet
1-3-15	S-13	Hazardous Communications	Keller, Information Sheet
1-3-16	S-14	Personal Protective Equipment	Keller, Inf. Sheet

New First-Year (cont.)

Number	Code	Title	Reference(s)
UNIT 1-4			
1-4-1	M-5	Solving Equations	NJATC Math
1-4-2	T-7	Ohm's Law	DC Theory, NJATC Math
1-4-3	T-8	Power	DC Theory, NJATC Math
1-4-4	J-17	Use and Operation of Blocks	Alexander, Van Soelen, & Inf.Sh
1-4-5	J-18	Slings and Chokers	Alexander, Van Soelen, & Inf. Sh
1-4-6	J-19	Rigging Hardware	Alexander
1-4-7	J-20	Guy Types, Guy Strength and Sizes	Van Soelen
1-4-8	J-21	Guy Installations	Van Soelen
1-4-9	J-22	Anchors	Van Soelen
1-4-10	J-23	Line Conductors	Van Soelen
1-4-11	J-24	Cross Arms and Attachments	Van Soelen
1-4-12	J-25	Insulators	Van Soelen
1-4-13	T-9	Resistance in Series Circuits	NJATC DC Theory, Inf. Sheet
1-4-14	T-10	Current in Series Circuits	NJATC DC Theory, Inf. Sheet
1-4-15	T-11	Voltage in Series Circuits	NJATC DC Theory, Inf. Sheet
1-4-16	T-12	Power in Series Circuits	NJATC DC Theory, Inf. Sheet
UNIT 1-5			
1-5-1	M-6	Mathematics For Parallel Circuits	NJATC DC Theory, NJATC Math
1-5-2	T-13	Voltage in Parallel Circuits	NJATC DC Theory
1-5-3	T-14	Resistance in Parallel Circuits	NJATC DC Theory
1-5-4	T-15	Current in Parallel Circuits	NJATC DC Theory
1-5-5	T-16	Power in Parallel Circuits	NJATC DC Theory
1-5-6	T-17	Principles of Magnetism	NJATC DC Theory
1-5-7	T-18	Magnetic Induction	NJATC DC Theory, Inf. Sheet
1-5-8	M-7	Ratios and Proportions	NJATC Math
1-5-9	J-26	The Electric System	Van Soelen
1-5-10	J-27	Wire Sizes, Types, and Characteristics	Van Soelen
1-5-11	J-28	Stringing Wire	Van Soelen, Inf. Sheet
1-5-12	J-29	Tying-In Conductors	Van Soelen
1-5-13	J-30	Overhead Service	Van Soelen
1-5-14	J-31	Insulate/Isolate	Van Soelen, Inf. Sheet
1-5-15	J-32	Insulated Platforms	Van Soelen, Inf. Sheet
1-5-16	J-33	Good Housekeeping	Keller, Inf. Sheet
UNIT 1-6			
1-6-1	T-19	Resistance in Combination Circuits	NJATC DC Theory
1-6-2	T-20	Current in Combination Circuits	NJATC DC Theory
1-6-3	T-21	Voltage in Combination Circuits	NJATC DC Theory
1-6-4	T-22	Power in Combination Circuits	NJATC DC Theory
1-6-5	J-34	Two-Way Radios - Proper Procedures	Inf. Sheet
1-6-6	J-35	Underground Systems	Van Soelen, Inf. Sheet
1-6-7	S-15	Excavation and Shoring	Van Soelen, Keller
1-6-8	J-36	Laying Conduit	Van Soelen Cable and Wiring
1-6-9	J-37	Manhole Construction	Van Soelen
1-6-10	J-38	Cable Types	Van Soelen
1-6-11	J-39	Pulling Cable	Van Soelen
1-6-12	J-40	Planning and Design For Underground Systems	Van Soelen
1-6-13	S-16	Baskets, Aerial Lifts, Aerial Platforms	Van Soelen, Inf. Sheet
1-6-14	S-17	Grounding and Protective Grounds	Van Soelen, Inf. Sheet
1-6-15	J-41	Taking a Line Out of Service	Van Soelen
1-6-16	S-18	Lock-Out Tag-Out - Line Applications	Van Soelen, Keller, Inf. Sheet

Codes For Lessons in The First Year

- O - Orientation (8)
- S - Safety (18)
- J - Job Information (41)
- M - Mathematics (7)
- T - Theory (22)

Textbooks Referenced

The Guidebook for Linemen & Cablemen -Van Soelen- Delmar
The Lineworkers Rigging Handbook - Alexander
Underground Distribution - Alexander
Building a Foundation in Mathematics - NJATC - Delmar
DC Theory - NJATC - Delmar
Utility Safety Handbook - Keller

LESSON OUTLINE

National Electrical Course
for
Apprentice Linemen

Second Year

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Lesson	Test	Code	Title	Reference
2-1-01		O-09	Sexual Harassment	TP
2-1-02		O-10	National Program	IS, TP
2-1-03		O-11	Becoming Familiar With the IBEW Constitution	IBEW Constitution
2-1-04		O-12	Understanding Your Local Union By-Laws	Local Union By-Laws
2-1-05		O-13	Parliamentary Procedure and How It Works	IS, IBEW Constitution
2-1-06		S-18	Introduction to 1910.269	IS
2-1-07		S-19	Hazardous Communication	CSH, IS
2-1-08	1	T-22	Theory Review - DC	AC, All Previous Lessons
2-1-09		T-23	Polarity of Voltage Across a Load	AC, IS
2-1-10		T-24	Introduction to Transformers	LCH, TP, IS
2-1-11		T-25	Wire Resistance	DC, LCH
2-1-12		T-26	Voltage Drop	DC, LCH, MA, IS
2-1-13		T-27	Principles of Generation	DC, LCH, IS.
2-1-14		T-28	Fundamentals of AC	AC, IS
2-1-15		M-9	Square Roots	MA
2-1-16			Unit One Review	All previous Lessons
2-2-01		J-43	Test Instruments/Metering Devices I	TI, IS
2-2-02		J-44	Test Instruments/ Metering Devices II	TI, IS
2-2-03		T-29	Distribution Circuits	AC, LCH, DVI
2-2-04		T-30	Principles of Three Phase AC	AC, LCH, DVI
2-2-05		T-31	Introduction to Inductance	AC, IS
2-2-06		T-32	Transformer Types/Nameplates	IS, DVI, LCH
2-2-07		T-33	Transformer Polarity/Connections	LCH, DVI
2-2-08	2	T-34	Transformers - Completely Self Protected (CSP)	LCH, DVI, IS
2-2-09		J-45	Installing Transformers	LCH, IS
2-2-10		T-35	Transformers - Single-Phase Connections	LCH, DVI, Lesson 2-2-6
2-2-11		T-36	Transformers - Three-Phase Voltages	AC, DVI, IS
2-2-12		T-37	Theory of Three-Phase Connections	AC, DVI, IS
2-2-13		T-38	Transformers - Three-Phase Connection Types	LCH, DVI, IS
2-2-14		T-39	Transformer Connections I	LCH, DVI
2-2-15		T-40	Transformer Connections II	LCH, DVI
2-2-16			Unit Two Review	All previous Lessons
2-3-01		B-1	Line Sketching	IS
2-3-02		M-10	Angles	MA, IS
2-3-03		M-11	Right Triangles	MA
2-3-04		M-12	Understanding Vectors	MA, AC
2-3-05		B-2	Introduction to Blueprints and Specifications	IS
2-3-06		B-3	Blueprint Fundamentals	IS
2-3-07		B-4	Blueprint Symbols, Conventions, and Abbreviations	LCH, IS
2-3-08		B-5	Reading Electrical Drawings and Diagrams	LCH, IS
2-3-09	3	J-46	Introduction to Using a Level and/or Transit	IS
2-3-10		B-6	Reading Maps, Plans, and Profiles	LCH, IS
2-3-11		B-7	Staking Sheets and Stakes	IS
2-3-12		S-20	Construction Standards/NESC	IS
2-3-13		B-8	Pole Top Construction	IS
2-3-14		J-47	Conductor Clearances	LCH
2-3-15		J-48	Conductor Joints - Distribution	LCH
2-3-16			Unit Three Review	All previous Lessons

Second year (cont.)

Lesson	Test	Code	Title	Reference
2-4-01		J-49	Cable Types and Sizes	CW, TS, LCH
2-4-02		J-50	Fault Indicators	IS
2-4-03		J-51	Locating Faults and Restoring Service	LCH, TI, IS
2-4-04		J-52	Explosives	IS
2-4-05		J-53	Testing Insulators - Megger	IS
2-4-06		J-54	Cable Terminations	CW, LCH, IS
2-4-07		J-55	Cable Splicing I	TS, CW, LCH, IS
2-4-08	4	J-56	Cable Splicing II	TS, CW, LCH
2-4-09		J-57	Cable Splicing III	TS, CW
2-4-10		J-58	Mobile Cranes	IPT
2-4-11		J-59	Boom Capacities and Load Charts	IPT, IS
2-4-12		J-60	Practical Applications - Vectors - Rigging	IS
2-4-13		J-61	Practical Applications - Vectors - Transformers	IS
2-4-14			Unit Four Review	All previous Lessons
2-5-01		J-62	Lifting and Digging Operations	IPT, LCH, IS
2-5-02		J-63	Hot Line Tools: Introduction, Identification and Care	LCH, HS
2-5-03		J-64	Tower Footings	LCH, IS
2-5-04		J-65	Tower Erections	LCH, IS
2-5-05		J-66	Joining High-Line Conductors	LCH, IS
2-5-06		J-67	Sagging Conductors	LCH
2-5-07	5	J-68	Dampers, Hold Down Weights, and Armor Rods	LCH, IS
2-5-08		M-13	The Circle	MA, IS
2-5-09		M-14	Prefixes and Powers of 10	MA, IS
2-5-10		M-15	The Metric System	MA, IS
2-5-11		M-16	Volume and Area	MA, IS
2-5-12		J-69	Street Lighting I - Information and Circuits	LCH, IS
2-5-13		J-70	Street Lighting II - Time and Light Control	LCH, IS
2-5-14		J-71	Street Lighting III - Street Lamps	LCH
2-5-15		J-72	Street Lighting IV - Troubleshooting	LCH, IS
2-5-16			Unit Five Review	All previous Lessons
2-6-01		J-73	Underground Cable Installation	LCH, CW, IS
2-6-02		J-74	Traffic Signals I - General Information	IS
2-6-03		J-75	Traffic Signals II - Traffic Signal Equipment	IS
2-6-04		T-41	Demand Factors	IS
2-6-05		T-42	Overvoltage Protection	LCH
2-6-06		O-14	American Labor History	TP
2-6-07	6	O-15	Communication II	IS
2-6-08		J-76	Phasing and Tying-in Circuits	LCH, IS
2-6-09		J-77	Overload Capabilities of Electrical Equipment	IS
2-6-10		J-78	Phase Sequence	LCH, IS
2-6-11		J-79	Backfeed	IS
2-6-12		O-16	Almost a Journeyman	IS
2-6-13			Unit Six Review	All previous Lessons

Codes for Lessons in the Second Year

O - Orientation
S - Safety
J - Job Information
M - Mathematics
T - Theory
B - Blueprints

Codes for References in the Second Year

IS - Information Sheet
TI - NJATC Test Instruments
IPT- IPT's Crane and Rigging
HS - Hot Sticks by A.B. Chance
AC - NJATC AC Theory Text
MA - NJATC Mathematics
LCH - Lineman's and Cableman's Handbook
CW - Cables & Wiring
TS - NJATC Terminations & Splices
TP - NJATC Training Partner
DC - NJATC DC Theory Text
DVI - NJATC Distribution Volume I
CSH - Keller's Official OSHA Construction Handbook

LESSON OUTLINE

NATIONAL ELECTRICAL COURSE
FOR
APPRENTICE LINEMEN

Third Year

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Lesson	Test	Code	Title	Reference
3-1-01		J-82	Testing Ground Resistance	NJATC Test Instruments, Info.
3-1-02		J-83	Maximeters	Sheet
3-1-03		T-43	Review of Alternating Current	Information Sheet
3-1-04	1	T-44	Alternating Current Theory	Herman, All Previous Lessons
3-1-05		T-45	Inductance	Herman, Kurtz, Information
3-1-06		T-46	Capacitors	Sheet
3-1-07		J-84	Distribution Capacitors	Herman, Info. Sheet, Previous
3-1-08		T-47	Fiber Optics I - Fiber Types	Lsns
3-1-09		J-85	Fiber Optics II - Cable Types	Herman. Info. Sheet, Billing
3-1-10		S-21	Fiber Optics III - Codes and Standards	Billing
3-1-11			Unit One Review	Information Sheet
				Information Sheet
				Information Sheet
				All Previous Lessons
3-2-01		J-86	Fiber Optics IV - Aerial Construction	Information Sheet
3-2-02		J-87	Fiber Optics V - Underground Const.	Information Sheet
3-2-03		J-88	Applying Rubber Protective Devices	Kurtz, Information Sheet
3-2-04	2	J-89	Live Line Maintenance with Hot Sticks I	A. B. Chance
3-2-05		J-90	Live Line Maintenance with Hot Sticks II	Kurtz
3-2-06		J- 91	Live Line Maintenance with Hot Sticks III	Kurtz
3-2-07		J-92	Live Line Maintenance with Hot Sticks IV	A. B. Chance
3-2-08		J-93	Live Line Maintenance with Hot Sticks V	A. B. Chance
3-2-09		J-94	Primary Metering	Kurtz, Information Sheet
3-2-10		J-95	Extra High Voltage (EHV)	Information Sheet
3-2-11			Unit Two Review	All Previous Lessons
3-3-01		T-48	Primary Fusing / Fuse Principles	Kurtz, Information Sheet
3-3-02		J-96	Reclosers and Sectionalizers	Kurtz, Billing
3-3-03		J-97	Substation Equipment Identification	Kurtz
3-3-04	3	S-22	Substation Safety Procedures	Information Sheet
3-3-05		J-98	Substation Construction	Information Sheet
3-3-06		J-99	Oil Circuit Breakers	Kurtz
3-3-07		T-49	Batteries	Herman
3-3-08		J-100	Oil Care and Filtering	Information Sheet
3-3-09		J-101	Air Break Switches	Kurtz
3-3-10		J-102	Watt Hours and Watthour Meters	Herman, Kurtz, Information
3-3-11			Unit Three Review	Sheet
				All previous Lessons

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Lesson	Test	Code	Title	Reference
3-4-01		J-103	Fault Currents	Information Sheet
3-4-02		J-104	Testing for Line Faults	Information Sheet
3-4-03		T-49	Voltage Regulation	Kurtz
3-4-04	4	J-105	Step Regulators and Tap Changing Transformers	Kurtz, Billing
3-4-05		J-106	Capacitors and Capacitor Switching	Kurtz, Billing
3-4-06		T-50	Transformer Review I	Billing, All Previous Lessons
3-4-07		T-51	Transformer Review II	Billing, All Previous Lessons
3-4-08		T-52	Transformer Review III	Billing, All Previous Lessons
3-4-09		T-53	Transformer Review IV	Billing, All Previous Lessons
3-4-10		J-107	Insulator Testing	Billing, All Previous Lessons
3-4-11			Unit Four Review	All Previous Lessons
3-5-01		J-108	Lightning Protection	Kurtz
3-5-02		J-109	Live Line Maintenance with Hot Sticks VI	A.B. Chance Co
3-5-03		J-110	Live Line Maintenance with Hot Sticks VII	A.B. Chance Co
3-5-04	5	J-111	Troubleshooting URD Systems	Kurtz
3-5-05		J-112	Substation Control Equipment	Information Sheet
3-5-06		T-54	Power Factor	Herman, Kurtz
3-5-07		T-55	Power Harmonics	Information Sheet
3-5-08		T-56	Wind Energy	Information Sheet
3-5-09		T-57	Photovoltaics	Information Sheet
3-5-10		M-15	Unit Five Review	All previous Lessons
3-6-01		O-16	Marketing II	Information Sheet
3-6-02		O-17	Marketing III	Information Sheet
3-6-03		O-18	Blue Print of the 90's	Information Sheet
3-6-04	6	O-19	Labor Management/LMCCs	Information Sheet
3-6-05		O-20	An Introduction to the COMET Program	Information Sheet
3-6-06		O-21	After Apprenticeship	Information Sheet
3-6-07		O-22	NEBF	Information Sheet
3-6-08		O-23	Foremanship	Information Sheet
3-6-09		O-24	Soon to be An Instructor	Information Sheet
3-6-10		O-25	Your Career	Information Sheet
3-6-11			Unit Six Review	All previous Lessons

Codes for Lessons in The Third Year

B - BLUEPRINTS
M - MATHEMATICS
J - JOB INFORMATION
O - ORIENTATION
S - SAFETY
T - THEORY